Ozone

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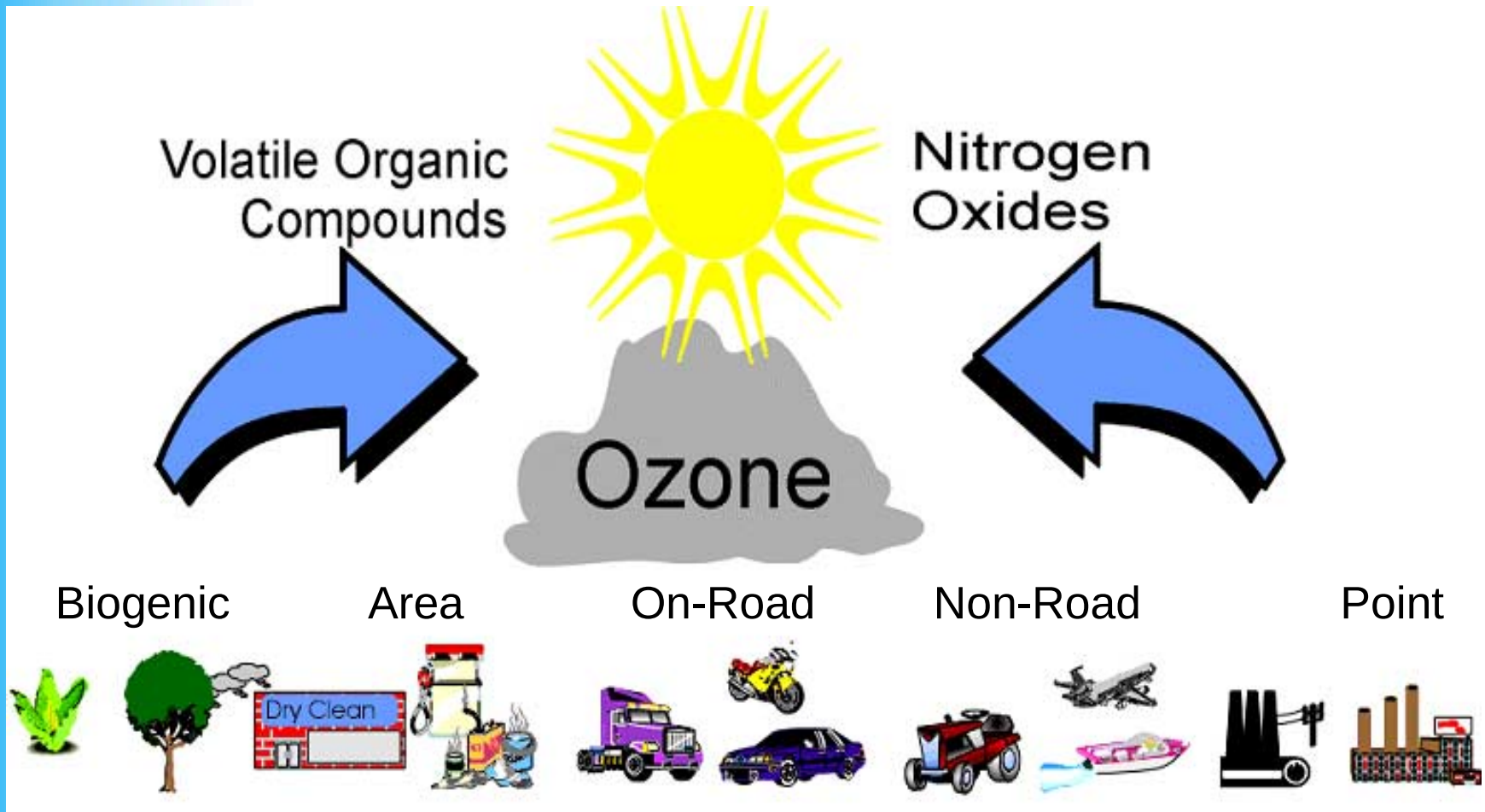
Division of Air Quality

June 29, 2005

Overview

- Formation of Ozone
- Health Effects
- Health-based Standards
- Sources of New Jersey’s Emissions
- What New Jersey needs to do

How Ground Level Ozone is Formed



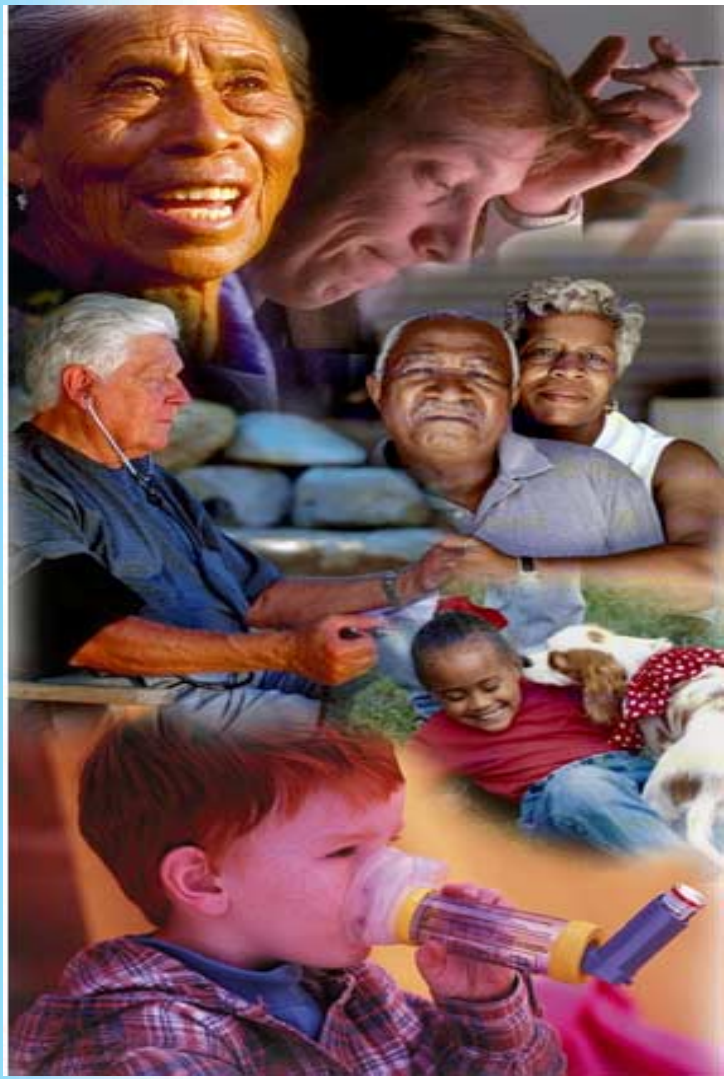
Ozone - Health Effects

- Decreases lung function
- Coughing and pain in the chest
- Increases susceptibility to respiratory infections
- Permanent damage to lungs
- Promotes allergic reactions
- Death

Health consequences associated with exposure to elevated levels of Ozone in New Jersey in 2002

- **Respiratory symptoms - 742,000**
- **Asthma attacks - 44,000**
- **Hospital admissions - 920**
- **Asthma(new illnesses) - 480**
- **Deaths - 80**
- **Emergency room visits - 30**

Groups More at Risk



- People with heart or lung disease
- Older adults
- Children

Environmental (Welfare) Effects

Increases plants susceptibility to disease, insects, other pollutants, and harsh weather

Damage to trees and other plants

Destroys landscapes

Damage to man-made materials

Ozone Health-based Standards

- 1-hour, 0.12 ppm ozone standard promulgated in 1979
  - The 4th highest daily maximum hourly average ozone concentration not to exceed 0.12 ppm over 3 consecutive years
  - Revoked in June 2005
  - 8-hour standard established because EPA determined that this standard was not sufficiently protective of public health
- 8-hour, 0.08 ppm ozone standard promulgated in 1997
  - The average of the 4th highest maximum 8-hour average concentration for 3 consecutive years not to exceed 0.08 ppm.
  - Entire state of NJ designated as nonattainment for 8-hour standard based on air monitoring data

Days on Which the Old and New Ozone Standards Have Been Exceeded in New Jersey 1988 - 2004

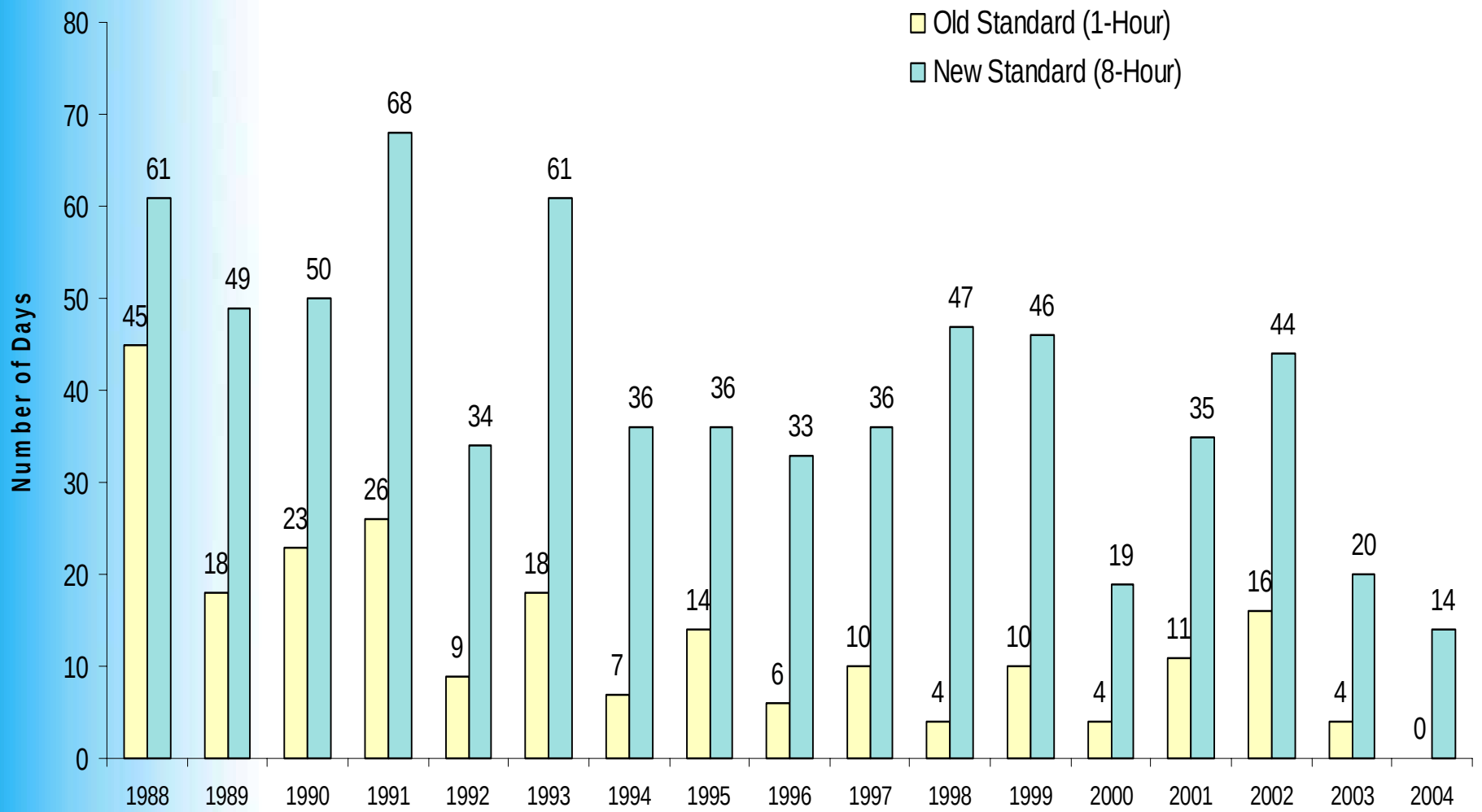


Figure 1: 1-Hour Ozone Design Values in New Jersey

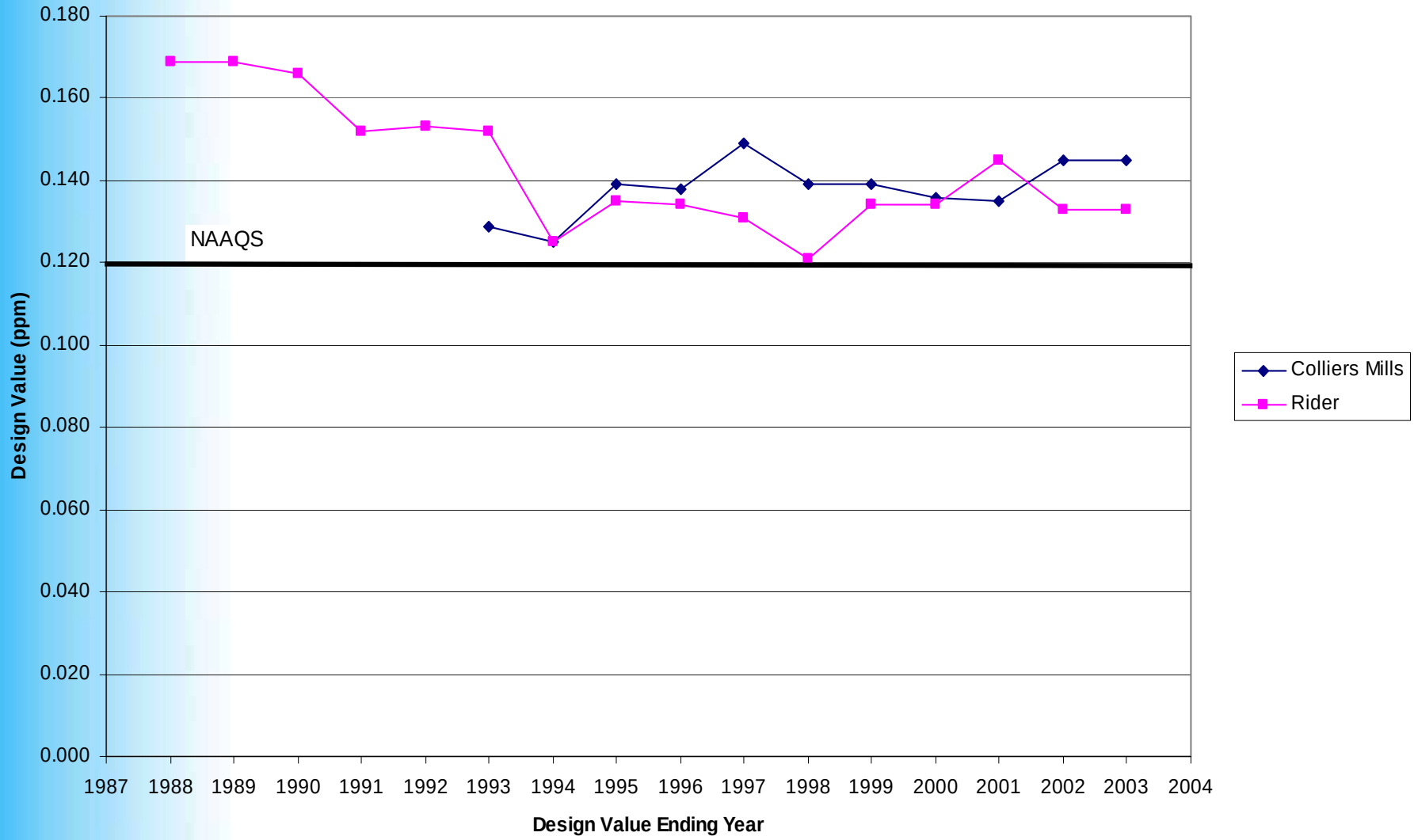
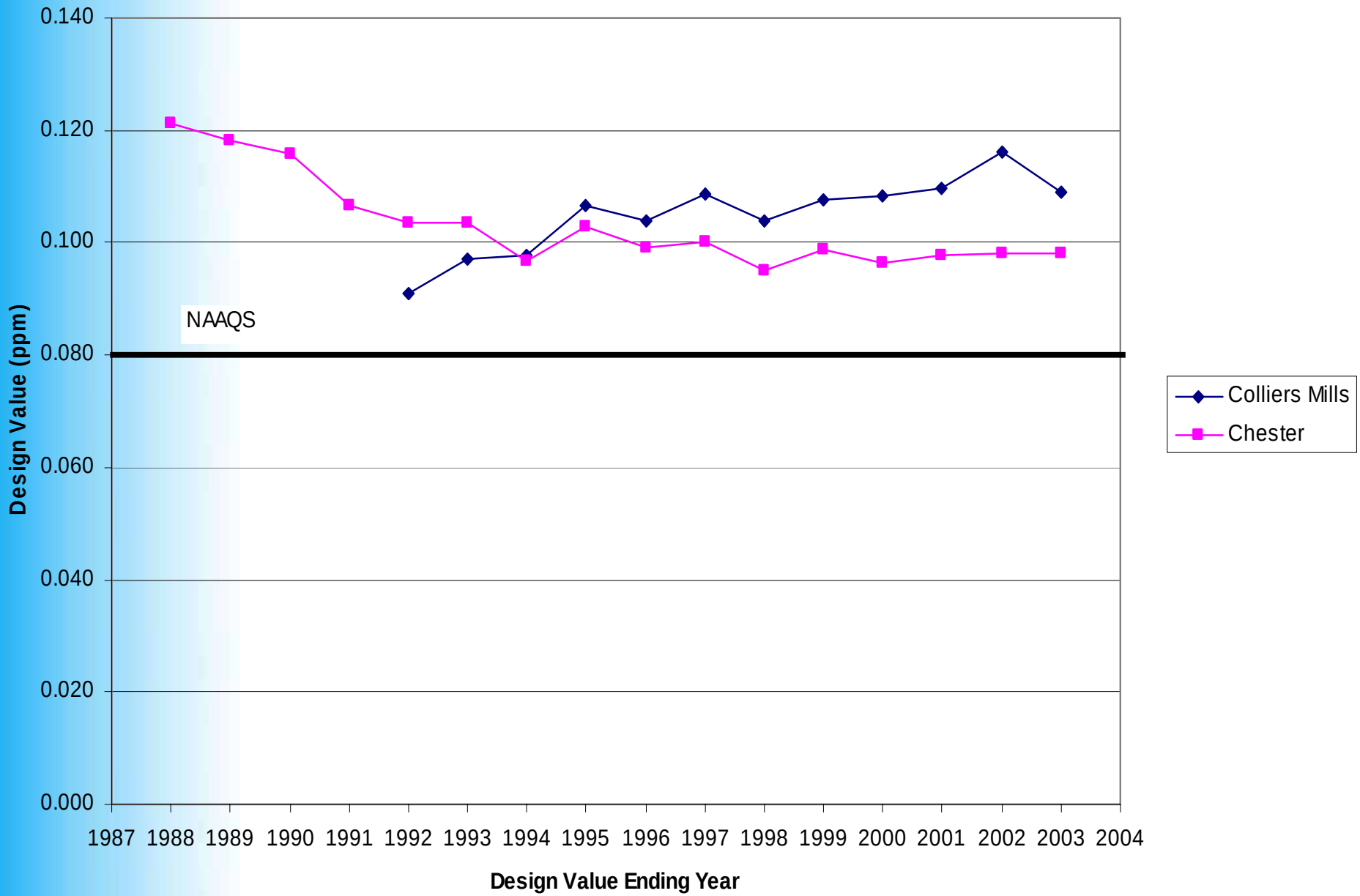
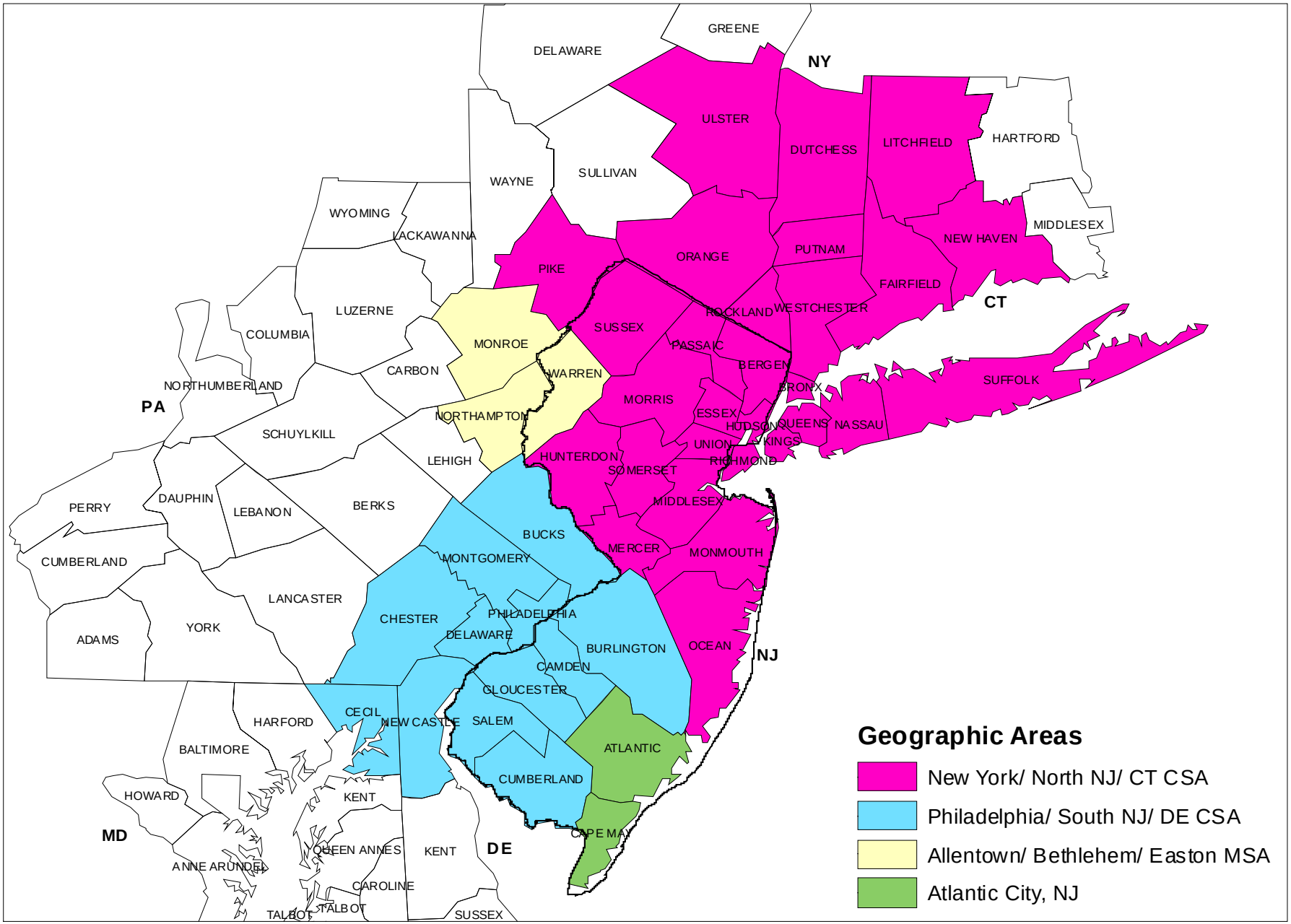


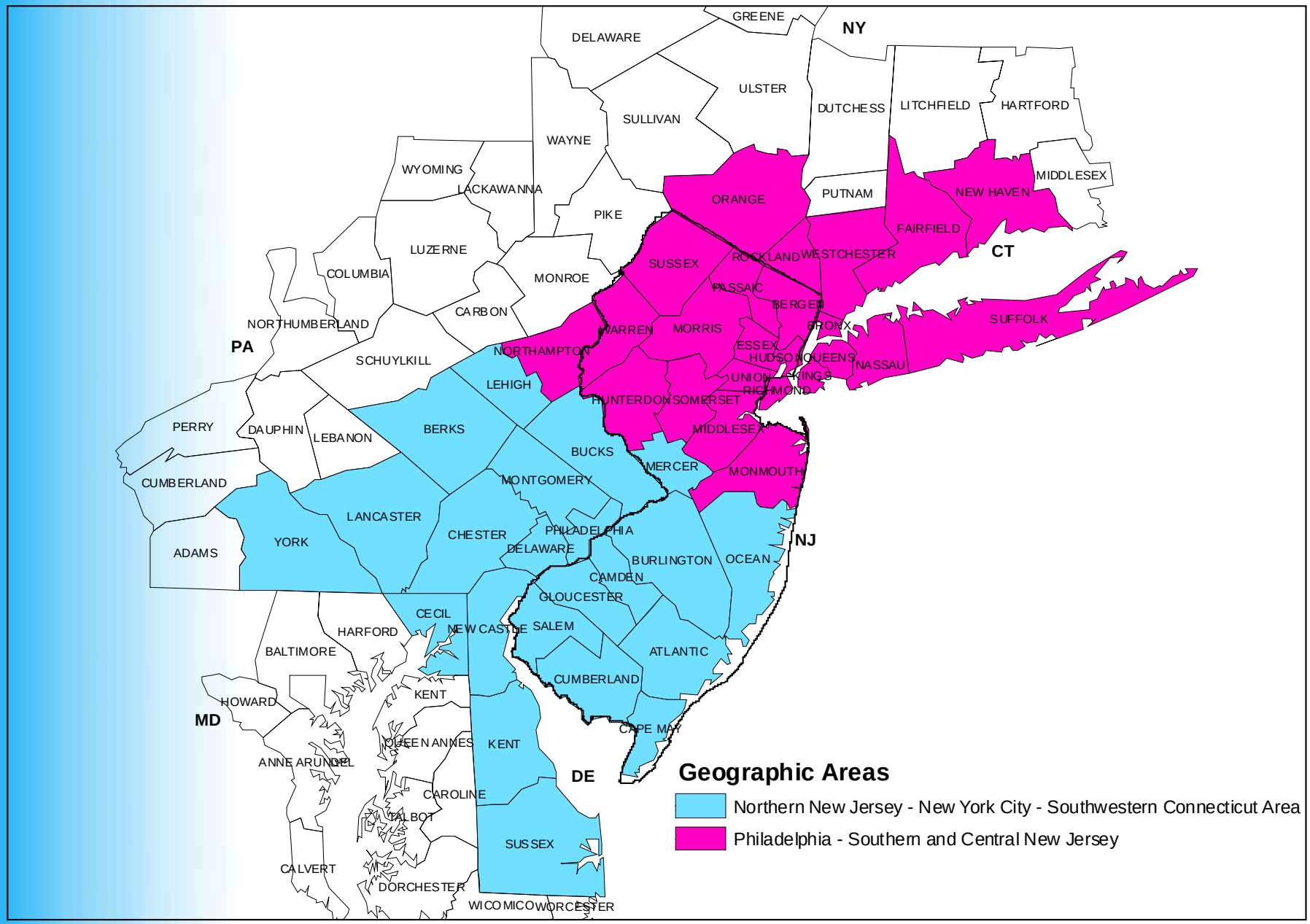
Figure 2: 8-Hour Ozone Design Values in New Jersey



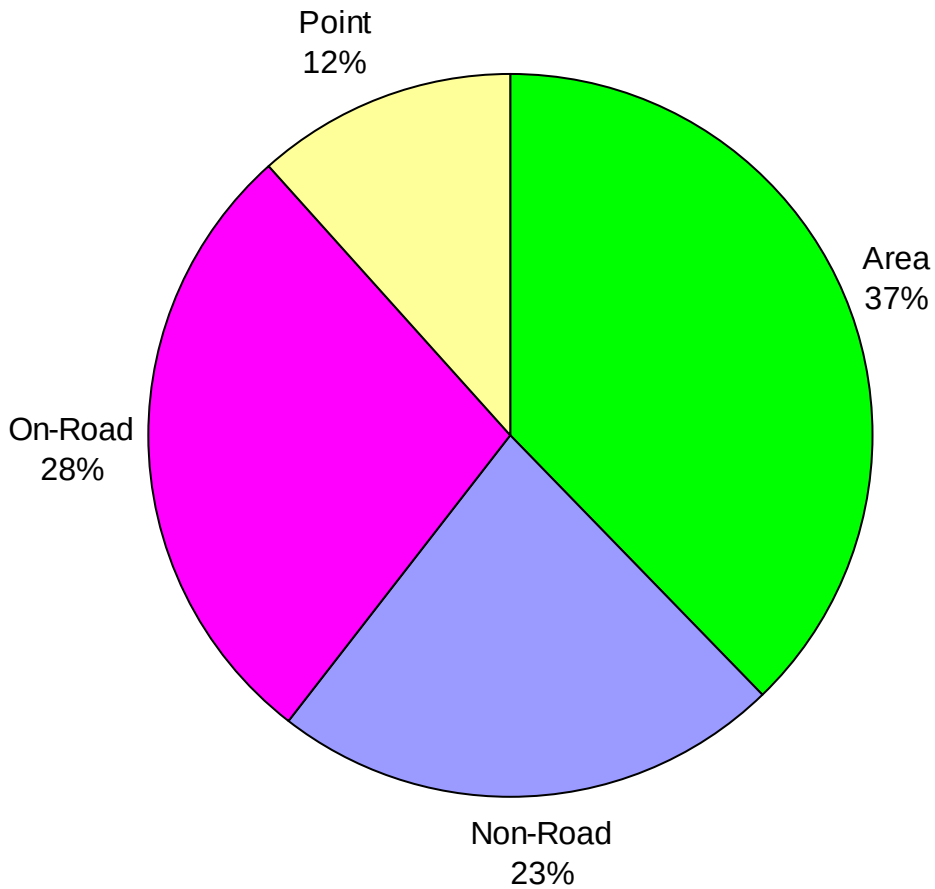
Previous 1-Hour Ozone Nonattainment Areas



8-hour Ozone Standard Multi-State Nonattainment Areas

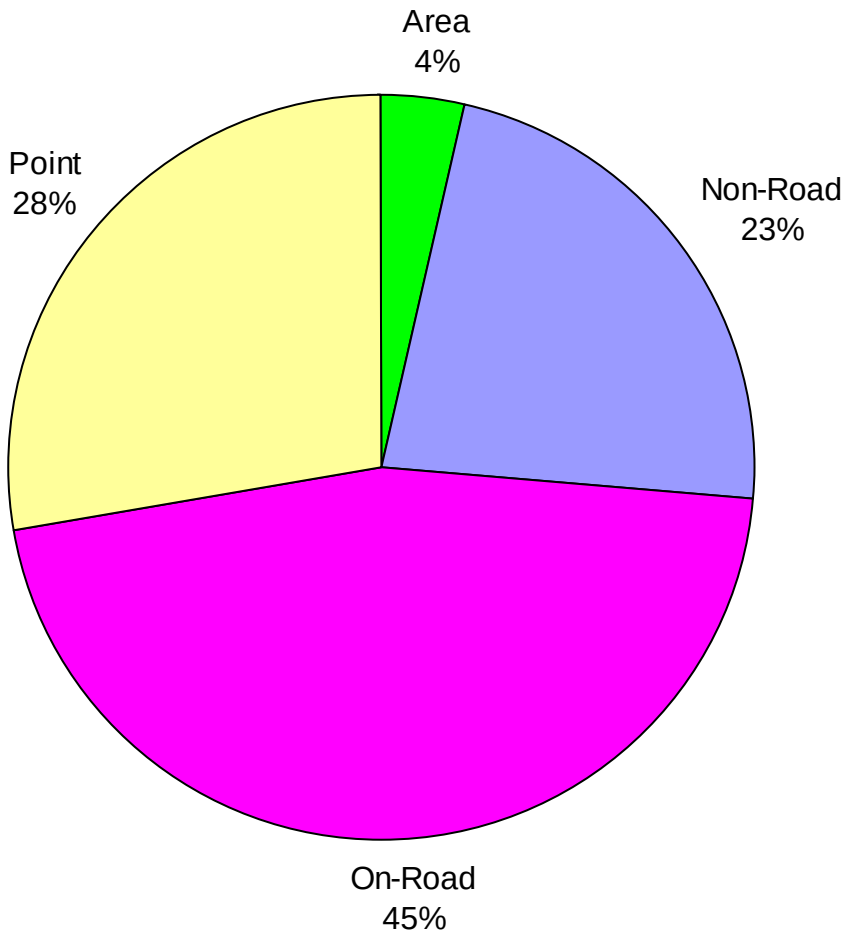


DRAFT 2002 New Jersey VOC Emissions by Sector



Total VOC Emissions - 977 tpd
(Anthropogenic sources only)

DRAFT 2002 New Jersey NO_x Emissions by Sector



Total No_x Emissions - 1,009 tpd

(Anthropogenic sources only)

USEPA Implementation Rule

- Part I (classification and designations) is effective

- Part II has been proposed and is expected to be adopted this summer
  - Rate of Progress (ROP)
  - Reasonably Available Control Measure (RACM)
  - Reasonably Available Control Technology (RACT)
  - Attainment Demonstration
  - Long-range transport
  - Mid-Course Review (MCR)
  - New Source Review (NSR)

New Jersey's SIP Schedule

- 2005 - 2006 - 2002 Emission Inventory
- September 2006 - Reasonably Available Control Technology (RACT)
  - Clean Air Interstate Rule (CAIR)
- June 2007 - Reasonably Available Control Measure (RACM)
  - Attainment Demonstration

New Jersey's Internal Plan

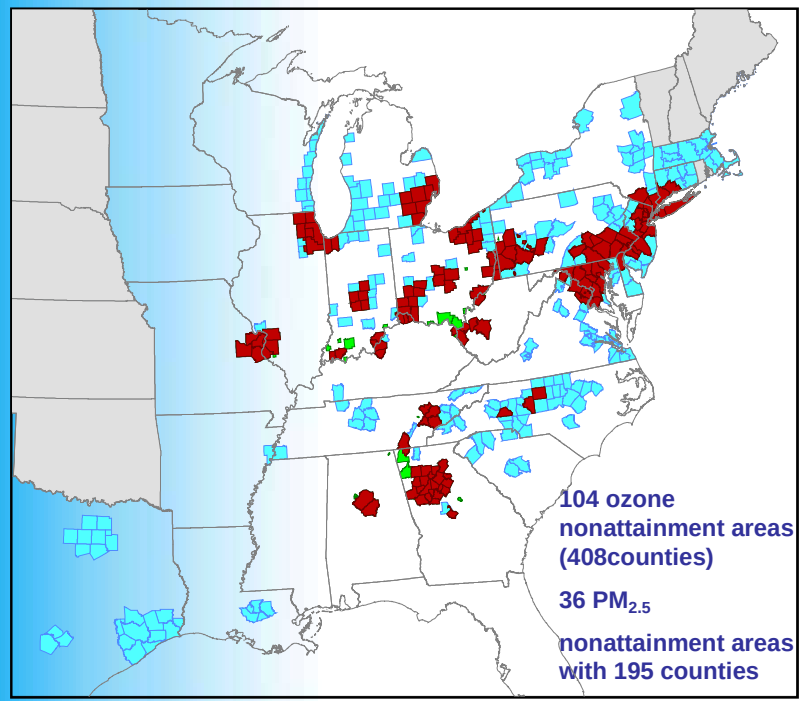
- Control Measures - September 2005
- Projection inventory - End of 2005
- Modeling - January thru May 2006
- Rules - On-going as needed

Clean Air Interstate Rule (CAIR)

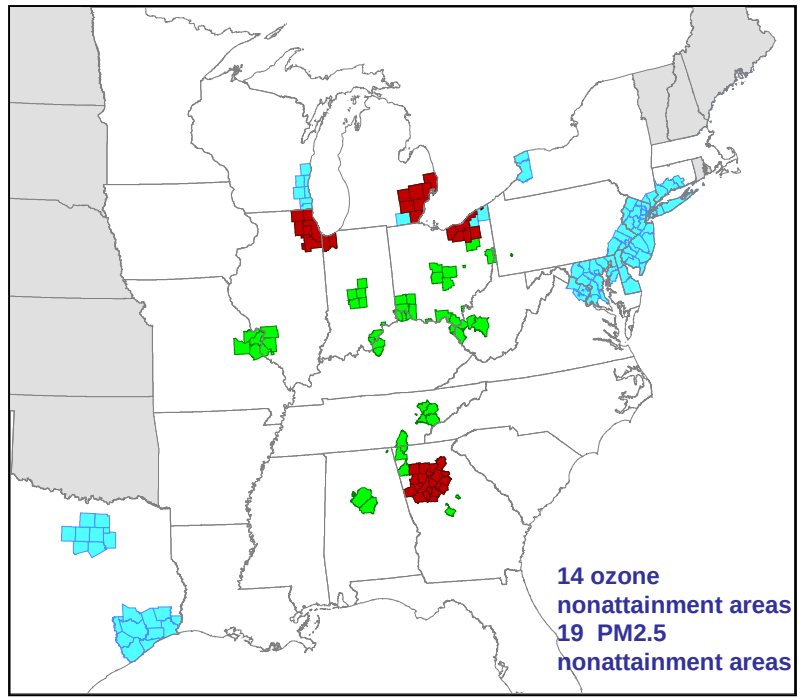
- Effective July 2005
- Reduces SO_2 and NO_x emissions
- Applies to 28 eastern states and the District of Columbia
- Goal is to address transport

Ozone and PM Attainment forecast with CAIR and with Other Clean Air Programs - 2010

Ozone and Fine Particle Nonattainment Areas (April 2005)



Projected Nonattainment Areas in 2010 after Reductions from CAIR and Existing Clean Air Act Programs



Nonattainment areas for 8-hour ozone pollution only

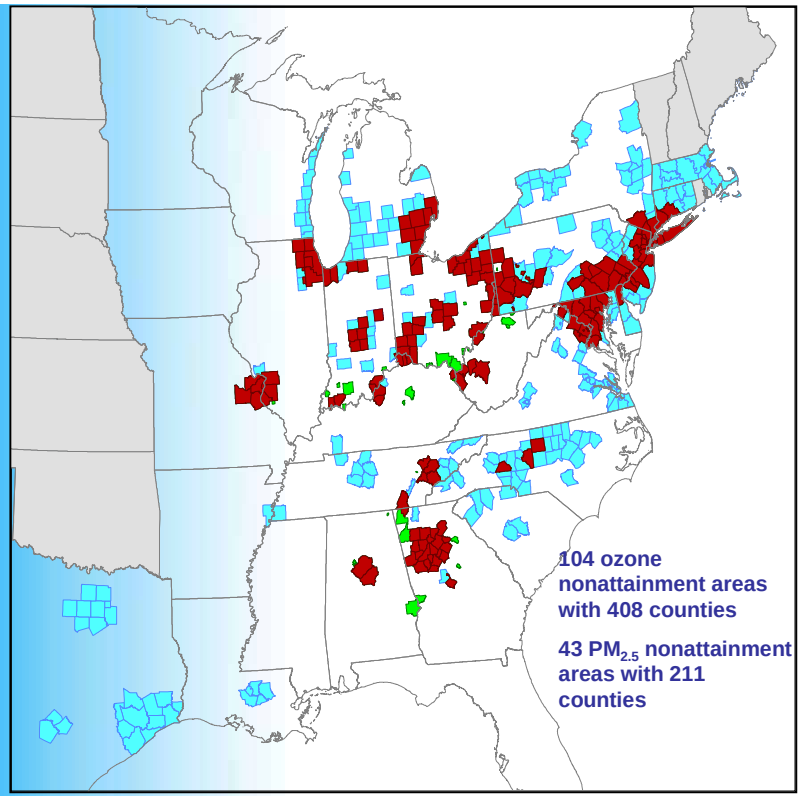
Nonattainment areas for fine particle pollution only .

Nonattainment areas for both 8-hour ozone and fine particle pollution

Projections concerning future levels of air pollution in specific geographic locations were estimated using the best scientific models available. They are estimations, however, and should be characterized as such in any description. Actual results may vary significantly if any of the factors that influence air quality differ from the assumed values used in the projections shown here.

Ozone and Particle Pollution: CAIR, together with other Clean Air Programs, Will Bring Cleaner Air to Areas in the East - 2015

Ozone and Fine Particle Nonattainment Areas (March 2005)

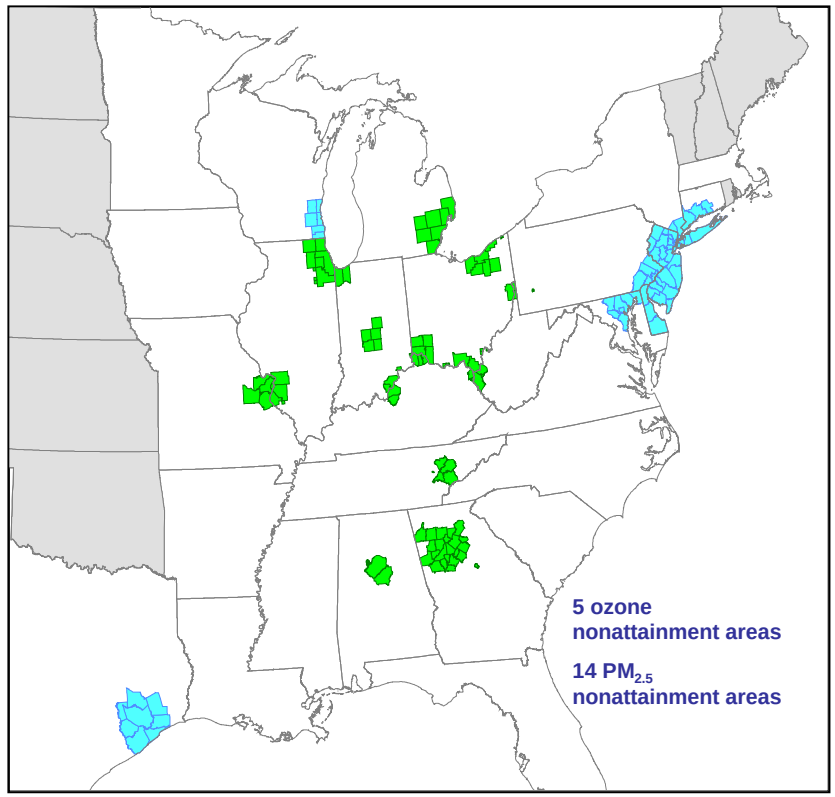


Nonattainment areas for 8-hour ozone pollution only

Nonattainment areas for fine particle pollution only

Nonattainment areas for both 8-hour ozone and fine particle pollution

Projected Nonattainment Areas in 2015 after Reductions from CAIR and Existing Clean Air Act Programs

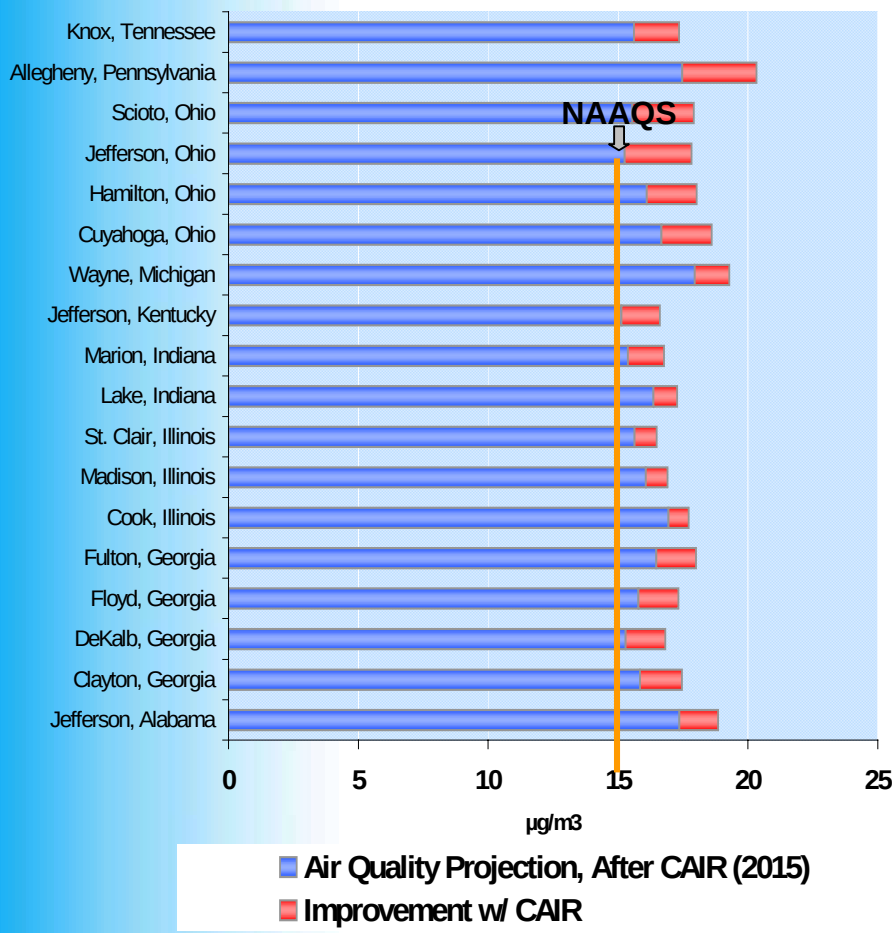


Nonattainment areas in 2015 w/ CAIR and other programs for 8-hour ozone

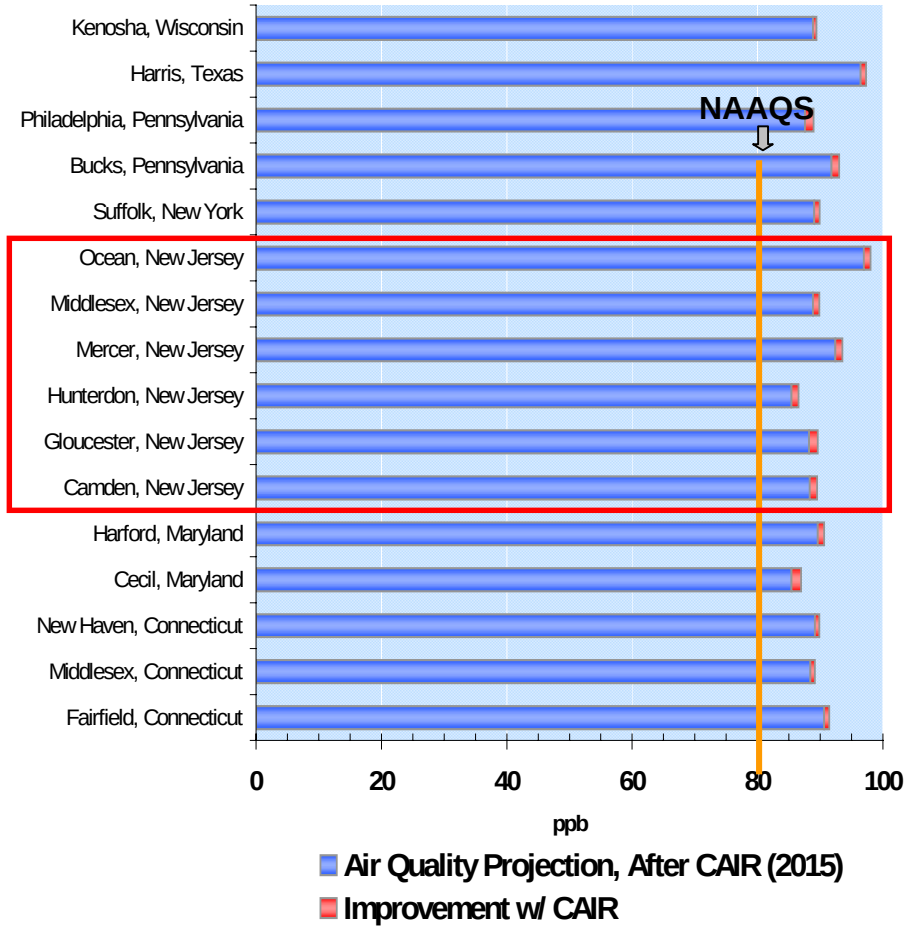
Nonattainment areas in 2015 w/ CAIR and other programs for fine particle

CAIR: Counties Closer to Attainment w/ NAAQS

Remaining Fine Particle Nonattainment (Annual Fine Particle Standard)



Remaining Ozone Nonattainment (8-Hour Ozone Standard)



Source: USEPA

Conclusion

- Elevated ozone levels have significant health and welfare impacts
- The Federal Clean Air Interstate Rule (CAIR) does not solve New Jersey's ozone problem
- Additional emission reductions are needed in New Jersey
- Due dates for State Implementation Plans to USEPA are fast approaching

For more information ...

- Ozone: Good Up High, Bad Nearby, USEPA, Office of Air Quality Planning and Standards, Research triangle Park, NC October 1997 URL:www.epa.gov/oar/oaqps/gooduphigh/
- National Air Quality and Trend Report, 1999, EPA-454/R-01-004, USEPA URL:www.epa.gov/oar/aqtrnd99
- Smog - Who does it Hurt?, EPA-452/K-99-001, USEPA, URL: www.epa.gov/airnow/health/
- Ozone and Your Health, EPA-152/F-002, URL:www.epa.gov/airnow/brochure.html
- www.epa.gov/cleanairinterstaterule
- www.state.nj.us/dep/airmon